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RESEARCH NOTE

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THE EFFECT OF TIMBER OVERSTORY ON DEER HABITAT IN MIXED CONIFER TYPE

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Ground cover usually grows sparsely under dense tree canopies and more densely under open stands of timber. Since deer depend upon the understory vegetation for food, the stand density and management practices that affect that density are of importance to the deer habitat.

To obtain baseline information on the relationships of overstory-understory densities, in 1959 we measured these factors at 132 plots on a deer range in the mixed conifer type on the west slope of the Sierra Nevada near Downieville, California. The overstory was measured by the Bitterlich method. 1/ The understory cover was measured by point intercepts at 1-foot intervals on a 10-square-foot grid centered on the Bitterlich points.

Understory density decreased significantly with increasing overstory density (fig. 1). However, the correlation in this regression analysis was very low (-0.3573); changes in overstory density account for only 13 percent of the changes in understory density. These findings correspond with those of Gaines, Campbell, and Brasington 2/, who found in southern Alabama that overstory accounted for only 14 percent of the changes in understory on longleaf pine lands.

When we consider individual species of ground cover, we find that the correlation with overstory density is sometimes greater than

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1/ Bonnett, Howbert W., Guides for variable plot cruising. Region 4, Forest Service, U. S. Dept. of Agr. 38 pp. plus 32 pp. unnumbered, illus. 1959.

2/ Gaines, E. M., Campbell, Robert S., and Brasington, J. J. Forage production on longleaf pine lands of southern Alabama. Ecology 35(1): 59-62. 1954.

the correlation of ground cover in general. Some species are more tolerant of overstory. Some are less tolerant. Although our study was not designed to show this species difference, we observed that bearmat (Chamaebatia foliolosa Benth.), for example, grows under open tree stands and not under dense stands. In contrast, tanoak (Lithocarpus densiflora (Hook. & Arn.) Rehd.) grew more abundantly under dense canopy. It is important, therefore, to distinguish the reactions of individual species in evaluating the effects of timber management practices on deer habitat.

We must recognize also that factors other than overstory density influence understory abundance. For example, Gaines, Campbell, and Brasington found that the amount of litter on the ground and the kinds of soil affected forage production more than overstory density. These and other possible influences will be measured along with the effects of overstory density in the intensive studies that will follow.

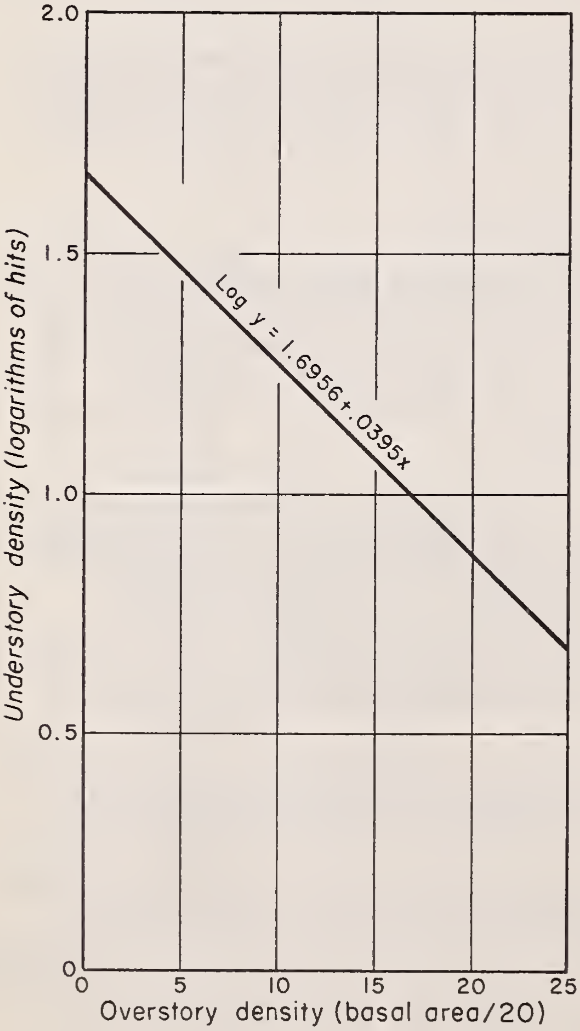

Figure 1.--Relationship of understory density to overstory density. Understory is expressed as the logarithm of the number of hits on vegetation on a grid sample of 100 points.